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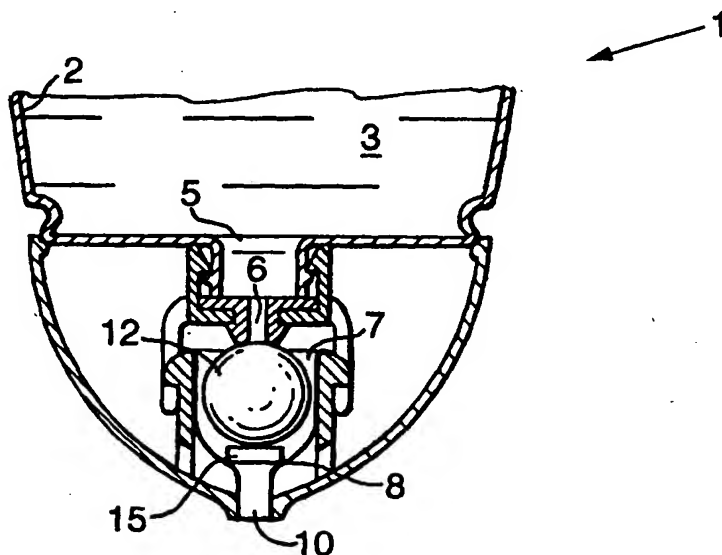
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(54) Title: DOSING DEVICE FOR TOILETS



(57) Abstract: An in-cistern dosing device (1) for dosing an active agent (3) into the flush water in a cistern during a flush comprises a chamber (2) for holding a reservoir of active agent, the chamber (2) having an outlet (5) and a valve (12) which is buoyant in the flush water and movable between a first position in which the outlet is closed and a second position in which a dose of product passes into the flush water. The device includes water soluble closure means (15) which prevents dosing of the active agent prior to insertion of the device into the flush water in a cistern. The water soluble closure means (15) is disposed on the device such when the device is placed into flush water in a cistern the water soluble closure means is dissolved in the flush water.

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*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

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**DOSING DEVICE FOR TOILETS****INTRODUCTION**

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The invention relates to devices which are mounted in a cistern of a toilet and which deliver a dose of active agent into the flush water in the cistern in response to flushing of the toilet, hereafter referred to as in-cistern dosing devices.

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**STATEMENTS OF INVENTION**

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According to the invention there is provided an in-cistern dosing device for dosing an active agent into the flush water in a cistern during a flush, the device comprising:-

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- a chamber for holding a reservoir of active agent, the chamber having an outlet;

25

- a valve which is buoyant in the flush water and which is movable between a first position in which the outlet is closed and a second position in which a dose of product passes into the flush water,

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characterised in that the device includes water soluble closure means which prevents dosing of the active agent prior to insertion of the device into the flush water in a cistern, wherein the water soluble closure means is disposed on the device such when the device is placed into flush

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water in a cistern the water soluble closure means is dissolved in the flush water.

The water soluble closure means may take many forms. For example the closure may comprise a layer of polyvinylalcohol or other water-soluble polymer which in use prevents access of the flush water to the valve, or prevents egress of the active product from a dosing channel.

Typically, the water-soluble closure means acts to prevent movement of the valve between the first and second positions. Thus, in one embodiment, the water-soluble closure acts to restrain the buoyant valve in the first position. In such cases, the buoyant valve is generally mounted in a dosing channel having a first end in fluid communication with the outlet of the active agent chamber and a second end forming a dosing channel outlet, the valve being movable between the first position wherein the valve abuts and closes the outlet of the active agent chamber and the second position where the valve is spaced from the outlet of the active agent chamber.

Prior to insertion of the device in the cistern of a toilet the water soluble closure is mounted in the dosing channel between the valve and the dosing channel outlet, thereby biasing the valve into sealing contact with the active agent chamber outlet. In such constructions the valve may suitably be a hollow ball.

In another embodiment of the invention the valve suitably comprises a dosing portion which is movably mounted within

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the outlet of the active agent chamber and includes a dosing chamber having a predetermined volume which is movable between the first position in which the dosing chamber is in fluid communication with the active agent in the active agent chamber, and the second position in which a dose of active agent in the dosing chamber is delivered into the flush water, via an intermediate position in which the dosing chamber neither communicates with the active agent chamber nor the cistern, and wherein the valve closes the outlet in all positions. Typically, the valve includes a buoyant portion, which is fixedly connected to, and movable with the dosing portion. In this embodiment, the water-soluble closure typically fixes the buoyant portion to the active agent chamber when the valve is in the first position. Ideally the water-soluble closure is a stud which engages respective overlapping holes on the buoyant portion and the product chamber. Thus when the device is placed in flush water in a cistern the flush water will solubilise the closure releasing the engagement between the buoyant portion and the product chamber and thereby freeing the valve for movement.

The water-soluble closure may also take the form of a spacer, which acts to space the buoyant portion and the product chamber. Typically in such instances the valve will be fixed in the intermediate or second position.

As is clear from the above disclosure the water-soluble closure can take many forms such as water-soluble plugs, water-soluble fasteners, water soluble adhesive tape etc. In all cases it is essential that the closures will

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solubilise in flush water. A suitable material for forming the closures of the invention is polyvinylalcohol, which is sold under many Trade Names including the following: AIRVOL 205, MOWIOL 40-88, EVANOL 51-05. Preferably the water-  
5 soluble polymers are cold water soluble.

The invention also relates to the combination of an in-cistern device according to the invention and an active agent composition for cleaning and/or freshening the toilet.  
10

#### DETAILED DESCRIPTION

The invention will be more clearly understood from the  
15 following description of an embodiment thereof, given by way of example only, with reference to the accompanying drawings in which:

Figs. 1 illustrates an in-cistern-dosing device according to  
20 the invention, shown in section, prior to insertion into a toilet cistern;

Figs. 2 and 3 illustrate the dosing device of Fig. 1 in a  
toilet cistern before and during a flush;

25 Referring to the drawings, there is illustrated an in-cistern dosing device according to the invention, indicated generally by the reference numeral 1, and comprising a chamber 2 for holding an active agent 3. The chamber 2 has  
30 an outlet 5 which is in fluid communication with an upper part of a dosing channel 7 via an upper neck channel 6, a

- 5 -

lower part of which forms a bottle neck 8 leading to a dosing channel outlet 10. A buoyant valve 12 in the form of a hollow ball is mounted within the dosing channel 7 and movable between the outlets 5 and 10. A water soluble closure 15 comprising a plug of polyvinylalcohol is mounted in the dosing channel 7 wedged between the neck 8 and the valve 12, the arrangement being such that the valve is forced against the outlet 5 preventing egress of active agent 3.

10

In use and referring to Figs. 2 and 3, the device is inserted into a toilet cistern and positioned such that the active agent chamber outlet is under the level of the water when the cistern is full. In practice the device may incorporate an adjustable hook for positioning the device thus. Once immersed in the cistern water, the water will dissolve the water-soluble closure 15 and due to its buoyancy the valve 12 will be biased into contact with the product chamber outlet 5 as shown in Fig. 2 thereby preventing any egress of product in between flushes. Fig. 3 illustrates what happens during a flush. In particular as the level of the flush water in the cistern falls the valve 12 will fall with it thereby opening the product chamber outlet 5 and dosing product into the flush water during the time that the water level in the cistern lies below the product chamber outlet 5. Once the flush has finished the cistern will re-fill with water and as the level of water rises, the valve 12 will rise with the water until it re-engages the product chamber outlet 5.

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In an alternative embodiment the water-soluble closure may take the form of a plug which blocks the dosing channel outlet 10. Thus in this embodiment the water-soluble closure does not prevent movement of the valve, rather the  
5 closure prevents the entry of water into the dosing channel and the egress of product into the cistern. The use of such a device is similar to that described with reference to the previous embodiment.



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**CLAIMS**

1. An in-cistern dosing device for dosing an active agent  
5 into the flush water in a cistern during a flush, the  
device comprising:-
- a chamber for holding a reservoir of active agent,  
the chamber having an outlet;
  - 10 - a valve which is buoyant in the flush water and which  
is movable between a first position in which the  
outlet is closed and a second position in which a  
dose of product passes into the flush water,
  - 15 characterised in that the device includes water soluble  
closure means which prevents dosing of the active agent  
prior to insertion of the device into the flush water  
in a cistern, wherein the water soluble closure means  
20 is disposed on the device such when the device is  
placed into flush water in a cistern the water soluble  
closure means is dissolved in the flush water.
2. A device as claimed in claim 1 in which the water-soluble  
25 closure means acts to prevent movement of the valve  
between the first and second positions.
3. A device as claimed in claim 2 in which the water-  
soluble closure restrains the buoyant valve in the first  
30 position.

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4. A device as claimed in claim 3 in which the buoyant valve is mounted in a dosing channel having a first end in fluid communication with the outlet of the active agent chamber and a second end forming a dosing channel outlet, the valve being movable between the first position wherein the valve abuts and closes the outlet of the active agent chamber and the second position where the valve is spaced from the outlet of the active agent chamber.

5. A device as claimed in claim 4 in which the water-soluble closure is mounted in the dosing channel between the valve and the dosing channel outlet.

6. A device as claimed in claim 2 in which the valve comprises a dosing portion which is movably mounted within the outlet of the active agent chamber and includes a dosing chamber having a predetermined volume which is movable between the first position in which the dosing chamber is in fluid communication with the active agent in the active agent chamber, and the second position in which a dose of active agent in the dosing chamber is delivered into the flush water, via an intermediate position in which the dosing chamber neither communicates with the active agent chamber nor the cistern, and wherein the valve closes the outlet in all positions.

7. A device as claimed in claim 6 in which the valve includes a buoyant portion, which is connected to, and movable with the dosing portion.

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8. A device as claimed in claim 7 in which the water-soluble closure fixes the buoyant portion to the active agent chamber when the valve is in the first position.
- 5 9. A device as claimed in claim 8 in which the water-soluble closure is a stud, which engages respective overlapping holes on the buoyant portion and the product chamber.
- 10 10. A device as claimed in any of claims 6 or 7 in which the water-soluble closure takes the form of a spacer, which acts to space, the buoyant portion and the product chamber.
- 15 11. A device as claimed in any preceding claim in which the water-soluble closure comprises polyvinylalcohol.

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Fig.1.

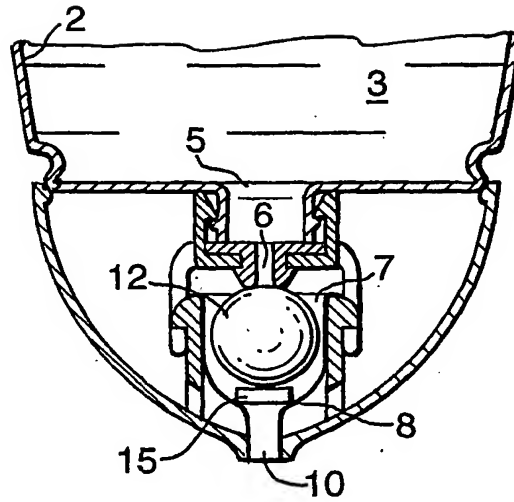


Fig.2.

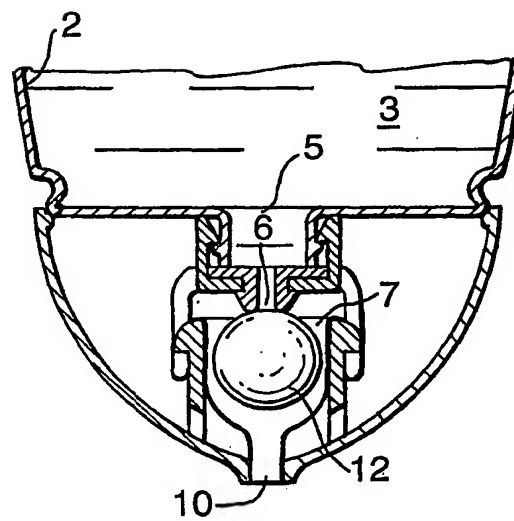
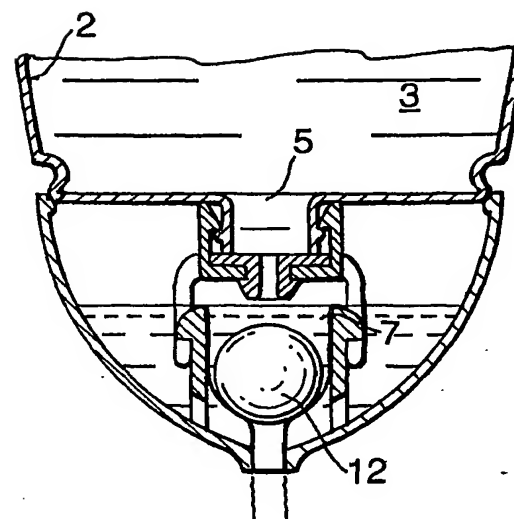


Fig.3.



## INTERNATIONAL SEARCH REPORT

Int. al Application No

PCT/EP 01/06095

## A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 E03D9/03

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 7 E03D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

EPO-Internal

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A	EP 0 008 148 A (PROCTER & GAMBLE) 20 February 1980 (1980-02-20) page 8, line 28 -page 9, line 6 page 11, line 10 - line 36 figures 1,2	1,5
A	DE 44 00 766 A (BUCK CHEM TECH WERKE) 20 July 1995 (1995-07-20) column 6, line 41 - line 65	11
A	US 1 928 483 A (GEROME JOHN A.) 26 September 1933 (1933-09-26) page 1, line 69 -page 2, line 5 figures	1,4
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Further documents are listed in the continuation of box C.



Patent family members are listed in annex.

## \* Special categories of cited documents :

- \*A\* document defining the general state of the art which is not considered to be of particular relevance
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## C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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